FOOD TECHNOLOGY

Published Monthly by

The Institute of Food Technologists

Volume 3 April, 1949 Number 4

Editor

C. Olin Ball
408 E. Broadway
Maumee, Ohio

Associate Editors

W. H. Cathcart
National Bakery Division
Great Atlantic & Pacific Tea Company
420 Lexington Avenue, New York 17, New York

H. C. Diehl
Refrigeration Research Foundation, Inc.
410 Mercantile Building, Berkeley 4, California

Herman W. Dorn
Irwin, Neisler Company, Decatur, Illinois

Charles N. Frey
Fleischmann Laboratories
Standard Brands, Inc., New York, New York

Warren H. Goss
Scientific Research and Technical Development Department
Pillsbury Mills, Inc., Minneapolis 2, Minnesota

J. L. Heid
Florida Citrus Canners Cooperative
Lake Wales, Florida

W. Ray Junk
California & Hawaiian Sugar Refining Corp.
215 Market Street, San Francisco 5, California

M. L. Laing
Armour and Company, Chicago 9, Illinois

L. S. McClung
Department of Bacteriology, Indiana University
Bloomington, Indiana

Emil M. Mrak
Food Technology Division
University of California, Berkeley, California

Aksel G. Olsen
Central Laboratories, General Foods Corporation
1125 Hudson Street, Hoboken, New Jersey

Bernard L. Oser
Food Research Laboratories, Inc.
Long Island City, New York

Bernard E. Proctor
Department of Food Technology
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

H. A. Schuette
University of Wisconsin, Madison 6, Wisconsin

G. C. Scott
Minnesota Valley Canning Company
Le Sueur, Minnesota

Paul F. Sharp
Giannini Hall
University of California, Berkeley 4, California

Harry W. von Loesecke
U. S. Department of Agriculture, Washington, D. C.

Paul C. Wilbur
Food Machinery Corporation, San Jose, California

Committee on Publications

Walter D. Pheteplace, *Chairman*
Philip K. Bates
John T. Knowles
H. C. Diehl, *Ex Officio*

CONTENTS

Editorial

The Student and Future Military Considerations 111

Notes and Letters

"Fresh Cockles" 111

What Research Means to the Frozen Food Industry 112

Precautions for Methyl Bromide Fumigations . 114

Process Evaluation 116

A Note on the Nature of a Flavor Constituent from Poultry Meat 118

Ascorbic Acid and Color in Food Products. C. W. DuBois 119

Frozen Apples and Apple Products. W. B. Esselen, Jr., C. R. Fellers, and J. E. W. McConnell 121

Further Considerations Relating to Evaluation of Thermal Processes for Foods. C. R. Stumbo . . 126

Mass Taste Panels. John H. Nair 131

Taste Perception and Taste Preferences of the Consumer. Katheryn E. Langwill 136

Fermentation Activity and Survival of Yeast in Frozen Fermented and Unfermented Doughs. Willard J. Godkin and William H. Cathcart . . . 139

Selected Abstracts *2*

News of the Institute *6*

Regional Section News *7*

Book Review *11*

Authors of papers intended for publication in Food Technology should request from the Editor's office a copy of a booklet, titled "Suggestions to Authors," and see that their papers are in the form specified therein before they are sent to the editor.

The Institute of Food Technologists assumes no responsibility for statements in contributed articles appearing in Food Technology. Editorials present only opinions of the writers and do not necessarily reflect policies of the Institute of Food Technologists.

Abstracts

(Continued from page 2)

NUTRITION

120I. The relative biological values of the proteins in cereal grains.

SURE, B., AND HOUSE, F. *J. Nutr., 36,* 595-600 (1948).

The biological values of milled and whole cereal grains, fed at a 5% protein level, were determined by the Mitchell nitrogen balance method. The protein utilization for the milled grains was as follows: rice, 75.1; wheat, 60.0; rye, 63.1; corn, 32.0. The findings for the whole cereals were: rice, 80.0; wheat, 76.1; rye, 73.2; corn, 78.8; and rolled oats (oatmeal), 75.6.

121I. Amino acid content of chicken.

MILLARES, R., AND FELLERS, C. R. *J. Am. Diet. Assoc., 24,* 1057-61, Dec., 1948.

An investigation was undertaken to determine the proportions of the indispensable amino acids in the protein of chicken meat, and to compare chicken meat with other common sources of food protein. Analyses by microbiologic methods indicated that chicken meat is equivalent to beef, pork, lamb, and veal meats on the basis of content of amino acids.

122I. Thiamine and riboflavin retention in beef tongue.

NOBLE, I., GORDON, J., AND CATTERSON, L. *J. Am. Diet. Assoc., 24,* 1068-9, Dec., 1948.

The thiamine and riboflavin contents of beef tongue have been determined by flourometric methods on three lots after simmering until tender (an average of 3 hr.) in sufficient water to cover, and on two other lots both before and after similar cooking. They ranged around 0.10 and 0.30 mg. per 100 gm. moist raw meat and around 0.04 and 0.35 mg. per 100 gm. moist cooked meat, respectively. The amount of thiamine retained in the tongue after cooking was about one-third of the quantity originally present in the raw sample. Another third was found in the cooking liquid. The amount of riboflavin retained in the cooked tongue was around nine-tenths of that present in the raw sample. The quantity dissolved in the cooking liquid was large also, so that the total riboflavin in the cooked meat and cooking water was greater than the amount found in the original raw sample.

123I. The vitamin B complex.

ELVEHJEM, C. A. *J. Am. Med., Assoc., 138,* 960-73 (1948).

A complete history and review, with an extensive bibliography.

124I. New vitamin discovered.

SCHNEIDER, H. A. *Sci. N. L., 54, 323,* Nov. 20, 1948.

A new vitamin which increases the natural resistance of the mouse to Salmonellosis, or mouse typhoid, has been found in cereals, grasses, wheat germ, and alfalfa. The vitamin was found to affect disease resistance in mice of mixed heredity, but not in inbred strains. The vitamin has not yet been isolated and identified chemically.

125I. Liver damage and growth in the rabbit.

THACKER, E. J., AND ELLIS, G. H. *J. Nutr., 36,* 579-91 (1948).

A diet of whole milk powder fortified with manganese, copper, iron and iodine is inadequate for the rabbit, growth is subnormal and the livers are damaged. Large amounts (50%) dehydrated alfalfa meal are needed to prevent liver damage, while only 1% is needed to stimulate growth. Roughage or known vitamins will not alleviate the condition. On purified diets rabbits evidently also need "animal-protein factor."

126I. Adding special sugar helps body utilize fats.

RICHTER, C. P. *Sci. N. L., 54,* 294, Nov. 6, 1948.

Rats made far better use of the fat in their diets when small amounts of galactose were present. Studies were made by the "single food choice" technique, and the length of time the rats survived was taken as a measure of the nourishing value of the foodstuff. Adding galactose to an oleomargarine diet more than doubled the survival time of the animals. Five percent or less of the total calories came from the galactose. Preliminary experiments with corn oil have yielded essentially the same results.

127I. Effect of feeding moderate levels of commercially agenized flour to dogs.

NEWELL, G. et al. *Proc. Soc. Expt. Biol. and Med., 69,* 1-2, Oct., 1948.

Dogs fed commercially treated flour (1.5 g. NCl_3/cwt.) did not develop running fits or electroencephalographic abnormalities after 12-14 months use.

128I. Effect of electronic cooking on nutritive value of foods.

THOMAS, M. H. et al. *J. Am. Diet. Assoc., 25,* 39-45, Jan., 1949.

The cooking time and amount of water used were the determining factors in retention of nutrients in vegetables. In the three cooking methods tested, the amount of water used had the greatest influence on the retention of water-soluble nutrients, the pressure cooking technique resulting in superior retention as compared to the boiling water and electronic range techniques. Thiamine retention was higher in meat patties cooked by high frequency energy than in patties cooked by grilling. Niacin and riboflavin were equally stable in both methods of cooking. Beef roasts showed slightly better retention of thiamine, riboflavin, and niacin when prepared in the oven than in the electronic range.

PHYSIOLOGY

129I. Carbon tetrachloride poisoning.

ABBOTT, G. A., AND MILLER, M. J. *Public Health Rep., 63,* 1619-24, Dec. 10, 1948.

The present allowed standard maximum is 100 parts of carbon tetrachloride per million of inspired air. Toxic reactions to carbon tetrachloride may result from a single brief exposure to a high concentration of the vapor, from prolonged or repeated exposure to a moderately high concentration or from regular daily exposure to lower concentrations; also from repeated contact with the skin or from ingestion. Obese persons, alcoholics, or undernourished individuals are likely to be especially susceptible to carbon tetrachloride injury, as are those with diabetes, liver or kidney disease, jaundice, pulmonary or heart disease, or peptic ulcers. Most of the poisoning cases could have been avoided by the proper ventilation.

FOOD PRODUCTS

COFFEE AND COCOA PRODUCTS

130I. Electronics—a new method for coffee roasting control.

SLATER, L. E. *Spice Mill, 71,* 14-15, Dec., 1948.

An electronic type of potentiometer radio-amplifies the electric signal generated by a thermocouple and provides a continuous, positive temperature measurement. The instrument can be used to provide an exact indication of when to terminate a roast from actual bean temperature.

131I. Cacao center at Turrialba.

BOWMAN, G. F. *Foreign Agric., 12,* 264-7, Dec., 1948.

The Inter-American Cacao Center is a part of the Inter-American Institute of Agricultural Sciences at Turrialba, Costa Rica. The center is organized to coordinate research work on cacao from all the interested countries of Latin America and to train students from these countries and from the other members of the Pan American Union in the basic principles of cacao cultivation. Phytophthora palmivora (pod rot of cacao) and its control is being studied.

FISH AND SEAFOOD

132I. Some data on pH and freshness of shucked Eastern oysters.

POTTINGER, S. R. *Comm. Fisheries Rev. 10,* 1-3, Sept., 1948.

With only two exceptions, the commercially shucked oysters had an initial pH of 6.2 or above. All of the samples that were shucked and blown in the laboratory had an initial pH above 6.2. Some variation in pH was found in both groups. During

(Turn to page 6)

Institute of Food Technologists

The Professional Society of Food Technologists

H. C. DIEHL, *President*
Refrigeration Research Foundation, Inc.
410 Mercantile Building
Berkeley 4, California

B. E. PROCTOR, *Vice-President*
Massachusetts Institute of Technology
Cambridge, Massachusetts

C. R. FELLERS, *Secretary-Treasurer*
Massachusetts State College
Amherst, Massachusetts

Councilors

Eugene V. Nay, P. K. Bates, E. A. Beavens, L. V. Burton, W. L. Campbell, B. S. Clark, E. D. Clark, W. V. Cruess, M. S. Dunn, K. G. Dykstra, F. W. Fabian, Charles N. Frey, R. D. Gerwe, H. T. Griswold, W. L. Haley, L. R. Hedrick, M. E. Highlands, W. Ray Junk, E. F. Kohman, E. E. Meschter, Emil M. Mrak, John H. Nair, Aksel G. Olsen, S. C. Prescott, A. C. Richardson, C. A. Shillingslaw, C. L. Smith, E. S. Stateler, A. E. Stevenson, M. P. Vucassovich, A. H. Warth, Jasper G. Woodroof.

Regional Section Chairmen and Secretaries

CHICAGO: Chairman, E. S. Stateler, Food Industries, 520 N. Michigan Ave., Chicago, Ill. Secretary, J. M. Jackson, American Can Co., Research Department, Maywood, Ill.

FLORIDA: Chairman, T. J. Kew, 1721 Westchester Ave., Winter Park, Fla. Secretary, George N. Pulley, P. O. Box No. 13, Winter Haven, Fla.

GREAT LAKES: Chairman, Ray B. Wakefield, Gerber Products Co., Fremont, Michigan. Secretary, James C. Sanford, Basic Food Materials, Inc., 845 State St., Vermillion, Ohio.

IOWA: Chairman, Wayne H. Montgomery, Penick & Ford, Ltd., Cedar Rapids, Iowa. Secretary, Robert G. Tischer, Agric. Experiment Station, Iowa State College, Ames, Iowa.

MARYLAND: Chairman, Frank Feild, Federal Yeast Corporation, Colgate Station, Baltimore, Md. Secretary, Joseph Winter, Crosse & Blackwell Co., 6801 Eastern Ave., Baltimore 24. Md.

MOHAWK VALLEY: Chairman, A. S. Burhans, Beech-Nut Packing Co., Canajoharie, New York. Secretary, L. L. Bowers, Beech-Nut Packing Co., Canajoharie, New York.

NEW YORK: Chairman, R. F. Light, Fleischmann Laboratories, 810 Grand Concourse, New York, N. Y. Secretary, Stephen L. Galvin, Huron Milling Co., 9 Park Place, New York 7, N. Y.

NORTHEAST: Chairman, Carl R. Fellers, University of Massachusetts, Amherst, Mass. Secretary, J. J. Austin, 15 Lang St., Concord, Mass.

NORTHERN CALIFORNIA: Chairman, W. Ray Junk, C. & H. Sugar Co., Matson Bldg., San Francisco, Calif. Secretary, R. D. McKirahan, American Can Co., 20th and 3rd Sts., San Francisco, Calif.

PHILADELPHIA: Chairman, G. V. Hallman, 5 West Maple Ave., Moorestown, N. J. Secretary, Miss Katheryn E. Langwill, Drexel Institute of Technology, 32nd and Chestnut Sts., Philadelphia 4, Pa.

PUGET SOUND: Chairman, C. L. Anderson, Washington State Dept. of Fisheries, 1308 Smith Tower, Seattle, Wash. Secretary, Francis P. Owens, Laucks Laboratories, Inc., 1008 Western Ave., Seattle 4, Wash.

ST. LOUIS: Chairman, A. F. Bucholtz, Union Starch & Refining Co., Granite City, Ill. Secretary, Miss Mary Heckman, Ralston Purina Co., St. Louis, Mo.

SOUTHERN CALIFORNIA: Chairman, Arthur N. Prater, C. B. Gentry Co., 837 N. Spring St., Los Angeles 12, Calif. Secretary, Miss Margaret M. Haws, C. B. Gentry Co., 837 N. Spring St., Los Angeles, Calif.

WESTERN NEW YORK: Chairman, John E. Fix, American Can Company, Lincoln-Alliance Bldg., Rochester, N. Y. Secretary, William S. Conway, Jr., 304 Dartmouth St., Rochester 7, N. Y.

Membership

Write to regional secretary, if within an area covered by a regional section, or to the Secretary of the Institute, for an application form and information regarding qualifications and classifications.

FOOD TECHNOLOGY

Official Monthly Publication of
The Institute of Food Technologists

Publication Office

Published by the Institute of Food Technologists and printed by The Garrard Press, 119-123 West Park Avenue, Champaign, Illinois.

Correspondence

EDITORIAL: Address all manuscripts, correspondence regarding manuscripts, proofs, etc. to C. Olin Ball, Editor, 408 E. Broadway, Maumee, Ohio.

MEMBERS' SUBSCRIPTIONS: Correspondence regarding a member's subscription should be sent to The Garrard Press, Champaign, Illinois or to C. R. Fellers, Secretary, Massachusetts State College, Amherst, Massachusetts.

Non-Member Subscriptions: Non-member subscriptions and renewals should be sent to FOOD TECHNOLOGY, The Garrard Press, Champaign, Illinois.

Back Volumes and Single Copies: FOOD TECHNOLOGY, The Garrard Press, Champaign, Illinois.

Advertising: For advertising rates and information about advertising in FOOD TECHNOLOGY write to Harley L. Ward, Advertising Manager, 360 N. Michigan Ave., Chicago 1, Illinois.

Eastern Advertising Office: Duncan Macpherson, 700 S. Washington Square, Philadelphia 6, Pennsylvania.

Reprints: FOOD TECHNOLOGY, The Garrard Press, Champaign, Illinois.

Subscription Rates

Subscriptions are entered for all members of the Institute of Food Technologists. The cost is included in the annual dues.

Non-members: domestic, $7.50 per year; foreign, $8.50 per year.

Single copies: domestic, 75c each; foreign, 85c each.

All subscriptions are entered to begin with first number of current volume.

Claims

Claims for copies lost in the mails must be received within thirty days (ninety days, foreign) of the date of issue. Notice of change of address must be received two weeks before date of issue.

Proceedings

The Institute of Food Technologists published PROCEEDINGS for the years 1940 through 1945, prior to the publication of FOOD TECHNOLOGY. Copies for most years are still available at the following rates: 1940, $3.50; 1941, $4.00; 1942, 1943, 1944, and 1945, $5.00. Order from The Garrard Press, Champaign, Illinois.

Mailing Permit

Entered as second-class matter February 25, 1947, at the post office at Champaign, Illinois, under the act of August 24, 1912.

Copyright, 1949, by the Institute of Food Technologists

Printed in U. S. A.

Abstracts

(Continued from page 4)

storage, the pH decreased gradually as the oysters became less fresh. For purposes of setting some arbitrary standard of comparison, the oysters were considered to be on the verge of inedibility when a distinct "off odor," no longer associated with that of "fresh" oysters, was noticeable. The bulk of the samples remained in good condition for ten days to two weeks before the off odor became apparent. The pH values of all of the oysters at the time the off odor was first noticed varied between 5.96 and 5.65. The data indicate, however, the pH values are a useful index in following changes in the degree of freshness of shucked Eastern oysters and should have some value in indicating quality when used in conjunction with other tests.

FROZEN FOOD

133I. Effect of storage temperature on frozen foods.

WOODROFF, J. G., AND SHELOR, E. *Refrig. Eng., 56,* 514-17, Dec., 1948.

There was a continual loss of natural appearance, color, aroma, and flavor when asparagus, snap beans, corn, strawberries, blackberries, raspberries, and peaches were held in freezing storage for one year or more. All of these except snap beans lost up to 50% of firmness and increased in leakage. When other conditions were constant, the rate at which these changes took place was directly related to the temperature of storage. Those products stored at —15° F. or lower were scored higher at each examination than those stored at higher or at fluctuating temperatures. These results extending over four years with temperatures ranging from —20 to 10° F. seem to show that 0° F. is adequate for most frozen foods for the period generally practiced. However, for some commodities or for periods of a year or more, —10 or —15° F. is preferable. Temperatures above 0° F. were not found satisfactory for any of the products studied.

134I. Frozen egg quality depends on clean eggs, clean equipment, and quick cooling.

WINTER, A. R., AND WRINKLE, C. *U. S. Egg Poultry Mag., 55,* 7-9, Jan., 1949.

Clean eggs with sound shells and good interior quality are essential to the production of liquid egg products with a low bacterial content. Pasteurization of liquid whole egg or yolk at 140-142° F. for two minutes, or of egg white at 134-135° F. for the same length of time, will kill more than 99% of the bacteria present in the product. Liquid egg should be placed in the freezer (—10° F., or below) as soon after preparation as possible because bacteria immediately may begin to multiply rapidly, especially if the egg is held above 60° F. Breaking plant equipment should be cleaned at least four times a day. All dead-end passages, exposed gaskets, and other sources of bacterial contamination should be eliminated in order to prevent bacterial multiplication and high count products.

135I. Precooking pork for freezing storage.

WATTS, B. M., PENG, D. H., AND KLINE, E. A. *J. Home Ec., 40,* 579-81, Dec., 1948.

Pork roasts precooked before freezing rated lower in palatability but higher in thiamine retention than paired cuts from the same animal cooked after freezing storage. Rancidity was not an important factor in palatability changes. Thiamine values for the raw meat and palatability scores for the cooked meat varied from animal to animal, even though all hogs were on the same rations. Aluminum foil was superior to waxed paper for wrapping. Chops to be precooked could be cooked, frozen, and thawed in the wrapper; thus bacterial contamination after cooking would be prevented.

136I. Concentrated and then quick frozen orange juice retains its vitamin C.

ROY, W. F., AND RUSSELL, H. E. *Food Ind., 20,* 1764-5 (1948).

Control laboratory data suggest that the nutritional value of orange juice reconstituted from the frozen concentrated juice is higher than that of the fresh juice. Reason for the higher

(Continued on page 12, following technical papers)

News of the Institute

PRESIDENTIAL CITATION

Dr. Ellery Hale Harvey has received that most distinguished decoration for civilian service, "The President's Certificate of Appreciation for outstanding contributions to the Office of Scientific Research and Development during World War II." This certificate was presented to him at ceremonies held in New York on December 10, 1948.

The Institute of Food Technologists takes just pride in this well-merited recognition received by Dr. Harvey, because his professional activities have been so long and so intimately associated with the affairs of the Institute. He is a charter member and a Past President of I. F. T. He was the founder of the Chicago Section and subsequently was instrumental in organizing the St. Louis Section of I. F. T. He organized the first annual conference of the national society in 1940 and, later, the annual conference in 1943. He likewise created the Nicholas Appert Medal Award which, since its inception, has proved to be the high point of each annual conference.

The heartiest congratulations of the Institute of Food Technologists are extended to Dr. Harvey on this Presidential Recognition of his contributions to the nation in its time of need.

TOWARD LARGER MEMBERSHIP

A Food Technology Group has been formed in Georgia for the South Atlantic area and, as of February 1st, had already held three meetings. The officers elected are:

Chairman: Dr. Roy E. Morse, Food Technology Department, University of Georgia, Athens.

Vice-Chairman: Dr. J. G. Woodroof, Georgia Experiment Station, Experiment.

Secretary-Treasurer: Dr. T. W. Kethley, Engineering Experiment Station, Atlanta, Georgia.

The membership numbered 35 at the beginning of February. The central meeting place is in Atlanta, Georgia, but members come not only from Georgia but also from parts of South Carolina, Alabama, and Tennessee that are within reasonable driving distances from Atlanta. At the suggestion of one of the members, it is proposed to call this group the "Dixie Section," and the probabilities are that when the membership increases, steps will be taken to make this a Regional Section of I. F. T.

The Ohio Valley Association of Food Technologists met in Columbus on February 5, with an attendance of 102. The group will have another meeting on May 21, at the Brown Hotel in Louisville. It is hoped that the group will qualify as a regional section of I. F. T.

A communication received from Colonel Charles S. Lawrence, President of the Quartermaster Board at Camp Lee, Virginia, indicates that interest in the formation of a Regional I. F. T. Section in that vicinity is growing. On February 18, at Richmond, Virginia, a meeting of food technologists was held at which 35 were present, including members and non-members of I. F. T. At the conclusion of a talk on "The Objectives

(Continued on page 7, following technical papers)

News of the Institute

(Continued from page 6, preceding Editorial)

of the I. F. T." by Stephen L. Galvin, Secretary of the New York Regional Section, it was decided to form a Food Technology Discussion Group. A committee was appointed to handle arrangements for future meetings, which will be held in various cities of the Virginia-North Carolina area. This committee is composed of:

Mr. Horace L. Smith, Jr. (Chairman), 301 Loch Lane, Richmond 21, Va.
Dr. Lyle L. Davis, Virginia Agricultural Experiment Station, Blacksburg, Va.
Mr. J. M. Fultz, Research Laboratories, Reynolds Metals, 10th and Byrd Sts., Richmond, Va.
Dr. Ivan D. Jones, Department of Horticulture, North Carolina State College, Raleigh, N. C.
Mr. W. A. Rooker, 112 E. Piccadilly, Winchester, Va.

It is hoped that by next autumn the group will have a sufficient number of I. F. T. members to form a Regional Section.

OUTSIDE PROFESSIONAL ACTIVITIES OF I. F. T. MEMBERS

At a meeting of the American Society of Refrigerating Engineers held in Washington, D. C., December 6-8, 1948, I. F. T. members gave papers as follows:

J. G. Woodroof, Georgia Agricultural Experiment Station: "Effects of Storage Temperature and Time upon Certain Fruits and Vegetables."
Gladys Vail, Kansas Agricultural Experiment Station: "Relationship of Storage Temperature to Characteristics of Frozen Pork."
Andrew Hustrulid *et al.*, University of Minnesota: "Effects of a Fluctuating Storage Temperature in Frozen Foods."
F. A. Lee, New York State Agricultural Experiment Station: "The Effect of Freezing Rate on Vegetables."

At a meeting held for discussion of "Merchandising through Research" at the annual convention of the National Association of Refrigerated Warehouses at San Francisco, February 7-10, the speakers included the following I. F. T. members:

Paul B. Christenson, Merchants Refrigerating Co., New York, N. Y.
Paul P. Logan, National Restaurant Association, Chicago, Ill.
Thomas W. Rector, General Foods Corp., New York, N. Y.

At the January 17 meeting of the Chicago Dairy Technology Society, Mr. Albert I. Kegan, a Chicago patent lawyer, was the principal speaker. His topic was "Trends in Government Regulation of the Food Industry."

At the Annual Meeting of the Southeastern Poultry and Egg Association, held in Atlanta, Georgia, Henry J. Reynolds of Armour & Co., Chicago, Ill., presented a paper on "Processing Improvements and Changes in Poultry."

At the Annual Convention of the National Canners Association in Atlantic City, January 14-20, Gordon T. Peterson of the Continental Can Co., Chicago, Ill., gave a paper on "Comparative Merits of Existing Methods of Producing Vacuum in Cans," and Robert W. Pilcher (American Can Co., Chicago, Ill.) and L. E. Clifcorn (Continental Can Co., Chicago, Ill.) gave a paper on "Nutrient Retention in Canning — A Summary of N. C. A.—C. M. I. Research Results."

At a meeting of the Association of Vitamin Chemists held in Chicago on February 10, Dr. James F. Feaster of the American Can Company, Maywood, Ill., led a discussion on methods of determining ascorbic acid. At this same meeting, Mrs. Mardell Tompkins, also of the American Can Co., delivered a paper entitled "Roe Method of Determining Vitamin C in Food Materials."

Regional Section News

CHICAGO SECTION

On February 21, the Chicago Section heard a talk given by Mr. E. C. Crocker of the Northeast Section on the subject of "Taste Evaluation of Foods." There was an attendance of 188 members for dinner and of approximately 200 members for the meeting, an attendance among the highest in the Section's history.

The following list of appointments to committee chairmanships for 1949 was announced at the meeting on January 24:

Auditing: Elmer F. Glabe, Food Technology, Inc., 5903 N. Northwest Highway, Chicago.
By-Laws: Gordon E. Carlson, College Inn Food Products Co., 4301 S. Ashland Ave., Chicago.
Finance: Robert M. Schaffner, Libby, McNeill & Libby, Union Stock Yards, Chicago.
Hospitality: Dorothy Ann Huber, QM Food and Container Institute, 1849 W. Pershing Road, Chicago.
House: Otto G. Braun, Research Division, American Can Co., Chicago.
Membership: William J. Shannon, Oscar Mayer & Co., Madison 1, Wisconsin.
Program: Rohland A. Isker, Filgrim Advertising, Inc., 222 West Adams St., Chicago.
Publications: Milton E. Parker, Illinois Institute of Technology, 3300 S. Federal St., Chicago.
Speakers Bureau: Leslie R. Hedrick, Illinois Institute of Technology, 3300 S. Federal St., Chicago.
Student: Virgil O. Wodicka, Libby, McNeill & Libby, 13636 S. Western Ave., Blue Island.
Historian: E. S. Stateler, Food Industries, 520 N. Michigan Ave., Chicago.
Parliamentarian: Milton L. Laing, Armour & Co., Union Stock Yards, Chicago.

Berton S. Clark has been appointed Chairman of the Packing, Packaging and Preservation Committee, National Research Council Advisory Board on Quartermaster Research and Development.

Milton E. Parker addressed the Women's Civic Club of Berwyn on January 18, on the subject of "Food Facts, Foibles, and Fancies."

Albert I. Kegan addressed a dinner meeting of the newly formed American Association of Candy Technologists, on February 3, on the topic "Trends in Government Regulation of the Candy Industry."

Gordon H. McDonell presented a technical paper on "The Canning of Beer" at the local meeting of the Master Brewers Association in Chicago on January 10.

Arthur E. Mudra was a speaker at the Indiana Corn Canners School at Purdue University on January 27.

L. E. Clifcorn has been appointed Chairman of the Exposition Trustees for the Sixth National Chemical Exposition, to be held in Chicago in 1950.

Charles L. Smith addressed two sections of the Campbell Soup Company Foremen's Club on January 4.

William J. Shannon, of Oscar Mayer & Co., Madison, Wisconsin, gave a talk to chemical engineers at

the University of Wisconsin on "Food Technology and the Chemical Engineer."

Members who have left the Chicago Section in recent months and gone elsewhere are listed below, together with their new addresses:

Name and old address
D. Q. Anderson, 474 Laurel St., Elgin, Ill.
New address: Florida.
Alvin J. Alton, Beatrice Creamery Co., Chicago, Ill.
New address: Taylor Freezer Co., Beloit. Wis.
Dr. John Van Dolah, Carnation Company, Milwaukee, Wis.
New address: Los Angeles, Calif.
A. E. Guest, 4106 Gilbert Ave., Western Springs, Ill.
E. A. Seipp, Golden State Sales Corp., Chicago, Ill.
New address: University Club, San Francisco, Calif.
Sue Cassell Stevens, Stevens Candy Kitchen, Chicago, Ill.
New address: 605 W. State St., Jacksonville, Ill.
Robert D. Walter, Corn Products Refining Co., Chicago, Ill.
New address: 3064 Kimball Rd., Memphis, Tenn.
Glenn H. Whetzell, Armour & Co., Chicago, Ill.
New address: Standard Oil Co.

NORTHERN CALIFORNIA SECTION

On February 17, the Northern California Section met in San Francisco and enjoyed an interesting double-feature program. The first feature was a motion picture entitled "The Salvage of the M. S. Diamond Knot," the story of the salvage operations on the cannery barge that sank in Alaskan waters last year. The speaker of the evening was John T. Walsh, in charge of quality development for the American Dried Milk Institute. His topic was "Packaging and Shipping of Hygroscopic Food Products," with special reference to dried milk.

A meeting has been planned for April 21, to be held in the East Bay. George Amerding (Majonnier Corp.) will describe the Majonnier "Lo-Temp" concentrator.

No section meetings will be held in July or August, because of the National Annual Meeting to be held July 11-14 in San Francisco. The joint meeting with the Southern California Section in October will also probably be cancelled this year, but a more definite announcement will be made later.

In accordance with the decision to establish a temporary status for students, the following were approved for student membership: Dale C. Miller, Tatsuo Sano, Gordon E. Miller, Chin-tzu Peng, Charles V. Lin Loy, and Robert L. Church.

National members transferring to the Northern California Section during the past few months include John H. Kilbuck and Albert J. Kraght of the University of California, and Calvin E. Bright of Frosted Foods, Sacramento.

Newly elected members include Edward M. Potter (Frostcraft), Robert L. Hughes (Pacific Grape Products), Richard E. Heyl (A. E. Staley), Rybern Gillespie, Preston Hunter and Georg Marinakis (all three of Kraft Foods), William H. Orth (Peerco Corp.), Vincent J. Lawson (Globe, Pillsbury Mills), and Herbert Lipke (California Packing Corp.).

George W. Burgess, of the Hawaiian Pineapple Company, and Carol C. Farley were married on November 15, 1948, at Laguna Beach, California.

Leo A. Berti, of the Coast Laboratories in Fresno, and Paula Margaret Gould were married on November 28, 1948, at Reno, Nevada.

Congratulations go to Dr. and Mrs. Emil M. Mrak (University of California) on the birth of a son, Robert Emil, on December 18, 1948.

F. K. Lawler, who is organizing the discussion group on "Advanced Food Plant Engineering" for the July Annual Meeting, was formerly Executive Editor of Food Industries and is now Editor in Chief.

Michael Arnaudo, chemist for California Packing Corporation, occupies his spare time as President of the Spastic Children Society and also serves as Vice-President and Program Chairman of the Washington School Dad's Club.

Paul Hunt, Advertising Manager of *The Hornblower* and associated with Owens-Illinois, has had a trip to the Hawaiian Islands.

Richard D. McKirahan, of the American Can Company, San Francisco, was called to Los Angeles to take over temporarily the vacancy caused by the death of Paul Alexander (see obituary in March issue of FOOD TECHNOLOGY).

Reese H. Vaughn, of the University of California, spoke at a Food Technology Conference at Corvallis, Oregon, on February 15 on the subject of plant sanitation. On February 17, he spoke at an olive conference in Corning. Last December he addressed a group of wine technologists in Lodi.

Maynard A. Joslyn, of the University of California, discussed the subject of "The Objective Evaluation of the Application of Various Sugars to Food Products" at the Dairy short course, Davis, in early February.

National President Dutch Diehl has been elected a Fellow in the American Public Health Association. On February 6-10 he held a joint Annual Meeting, at the Mark Hopkins Hotel, of The Refrigeration Research Foundation and the National Association of Refrigerated Warehouses.

NORTHEAST SECTION

A successful and well-attended meeting on "Fishery Technology" was held on February 7 at the Boston Yacht Club, right out on the ocean. The rooms of the club were virtually in a sail loft, over a wharf, and had all the marine atmosphere needed, with boat models on the wall and a ship's clock striking out the half hours. After a fish chowder dinner and entertainment by a barbershop quartet, five papers were read concerned with present operation and opportunities for improvement by the fishing industry. (See March issue of FOOD TECHNOLOGY for names of speakers and titles of papers.)

Approximately 150 members and guests attended this meeting, and the fishing industries in Boston and environs were well represented. A number of out-of-town guests were present, as follows:

Lamar Kishlar, Ralston Purina Co., St. Louis, Mo.
J. M. Lemon, U. S. Fish and Wildlife Service, Washington, D. C.
Arthur Monroe, Fishery Products Ltd., St. John's, Newfoundland.
B. F. Buchanan and S. E. Juratovic, International Mineral & Chemical Corp., Chicago, Ill.
John B. Glud and John R. Webster, U. S. Fish and Wildlife Service, Woods Hole, Mass.
Boris O. Knake, U. S. Fish and Wildlife Service.
M. G. O'Connor, Health Department, Springfield, Mass.

Robert L. Perry, Department of Sea and Shore Fisheries, Augusta, Maine.
Francis W. Sargent, Director of the Division of Marine Fisheries, Commonwealth of Massachusetts.
Howard S. Willard, Chief Coastal Warden, Commonwealth of Massachusetts.

Ernest C. Crocker, present Vice-Chairman of the Northeast Section, a charter member of I. F. T., and associated with Arthur D. Little, Inc., Cambridge, Mass., has given talks all over the Midwest this season on "The Chemistry of Flavor and Odor." These talks he has presented as a touring speaker for the American Chemical Society, of which he is chairman of the Northeastern Section this year. One of his talks, at Chicago, was under I. F. T. sponsorship, and two others were under the joint sponsorship of the American Chemical Society and I. F. T. On February 23 he gave this talk at a joint meeting of the Iowa Section of I. F. T., the Ames Section of the American Chemical Society, and the Iowa State College Research Council. Recently Mr. Crocker has been engaged in problems involving the application of the senses of smell and taste to industrial products. His numerous papers and his book on "Flavor" have attracted wide attention.

The many friends of Mason T. Rogers will be pleased to learn that he is making steady progress since his recent illness and is up, if not yet about freely. He will be happy to receive letters, addressed to his home at 48 Cedar Road, Belmont, Mass., and may now have short visits from his local friends.

I. F. T. members will be sorry to learn that Michel P. Vucassovich, of the Gorton-Pew Fisheries Co., Ltd., Gloucester, Mass., had the misfortune to break his ankle while on a trip to Nova Scotia. He is recuperating satisfactorily and will soon be about again.

Several members of the Northeast Section are planning to attend the annual I. F. T. meeting in San Francisco in July. At this time the following can be named: L. B. Sjöström of Arthur D. Little, Inc.; B. E. Proctor of the Department of Food Technology, Massachusetts Institute of Technology; Michel Vucassovich of Gloucester; Carl R. Fellers of the University of Massachusetts. Efforts will be made to have a special car, if enough persons are interested.

SOUTHERN CALIFORNIA SECTION

At the February 16 meeting of the Southern California Section, Dr. Franz Goetzl, Director of the Permanente Foundation for Research in Oakland, California, spoke on "Studies on Human Appetite." He described an instrument used in the Institute by means of which the threshold for the perception of a standard smell can be measured quantitatively. Following his talk, Dr. A. J. Haagensmit, of the California Institute of Technology, led a lively discussion.

Two guests of note present at the dinner were Dr. B. Bloemers of the University of Utrecht, Holland, and Dr. S. C. Prescott, Dean Emeritus of the Massachusetts Institute of Technology, active in the origination of the National Institute of Food Technologists.

Dr. P. K. Bates, Section Councilor, reported to the group on the business conducted by the Council Meeting in Atlantic City on January 16.

The forty odd radio broadcasts of the Southern California Section of the American Chemical Society have featured interviews with "Chemists in Action," among whom were individuals who are also members of I. F. T. These particular individuals and the subjects of their interviews are as follows:

Dr. Philip K. Bates: Hay Fever.
Dr. Arthur N. Prater: Food Flavorings.
Mr. Leslie Hart: Chemists in Agriculture.
Dr. Willard E. Baier: Citrus Fruit Products.
Mr. Abe Seldner: Chemistry and Pleasant Smells.
Mr. Arthur Cherkin: Eating through a Needle.
Mr. Franklin H. Hunsicker: Making Appertizing Appetizing.
Dr. Harry J. Deuel: Progress in the Chemistry of Nutrition.
Dr. Margaret G. Morehouse: Fat Soluble Vitamins.

ST. LOUIS SECTION

On February 17, the St. Louis Section met at the Monsanto Chemical Company. The speaker of the evening was Dr. B. F. Buchanan, Technical Service Director, Amino Products Division, International Mineral and Chemical Corporation, Chicago, Ill. He spoke on the subject of "Monosodium Glutamate and Its Use in Food Manufacture."

GREAT LAKES SECTION

On January 28, the Great Lakes Section met in the Engineering Society Building at Detroit, Michigan. During the afternoon session the following papers were presented:

Mr. William J. Scarlett, Wallace & Tiernan Co., Newark, N. J. Subject: "Chlorination Applied to the Food Industry."
Mr. C. D. Pratt, Atlas Powder Co., Wilmington, Delaware. Subject: "Food Emulsifiers from the Hexitols."
Mr. Sereck H. Fox, Technical Director of Gelatine Products, Division of R. P. Scherer Corp., Detroit, Michigan. Subject: "Four Billion Capsules Annually." His talk was accompanied by a short motion picture on the problems associated with capsule production.

Following the dinner, at which 35 members were present despite hazardous driving conditions, Mr. R. C. Pollock, General Manager of the National Live Stock Board, Chicago, Ill., gave a talk on "Animal Agriculture and the Nation's Economy."

To aid in getting news of interest to the office of the national I. F. T., President Ray Wakefield appointed members of the Great Lakes Section to send news to the local secretary, who in turn will edit and forward the news to the appropriate Associate Editor of Food Technology. These members are:

Mr. Paul A. Wolf, Dow Chemical Co., Midland, Mich.
Miss Edna Mae McIntosh, Gerber Products Co., Fremont, Mich.
Mr. T. B. Calder, W. Clark Ltd., Montreal, Canada.
Miss Pauline Paul, Michigan State College, E. Lansing, Mich.
Miss Camille Beauchamp, Westinghouse, Mansfield, Ohio.

PHILADELPHIA

On February 11, the Philadelphia Section held a dinner meeting, at which the speaker was Mr. Martin Eisenstaedt, Director of Bakeries, American Stores Company. The subject of Mr. Eisenstaedt's talk was "Controlling Processes in Bakery Management."

MARYLAND SECTION

On February 11, the Maryland Section met for its regular session at the Hotel Stafford in Baltimore. Following the dinner, Mr. C. D. Pratt of the Atlas

Powder Company of Wilmington, Delaware, spoke on "Food Emulsifiers from the Hexitols."

Dr. Ira A. Gould, formerly Professor of Dairy Manufacturing at the University of Maryland, has become Chairman of the Department of Dairy Technology at Ohio State University.

PUGET SOUND SECTION

Members of the Puget Sound Section met at the food products plant of the Crescent Manufacturing Company, Seattle, Washington, on the evening of February 15. A comprehensive tour of the plant was made, and members were afforded an opportunity to see methods used in manufacturing and procedures used in controlling the grades of the many quality products put up by the Company. The tour was followed by refreshments and a business meeting.

New Executive Committee members were elected as follows:

James C. Palmer, U. S. Food and Drug Administration, Seattle, Wash.
Robert L. McDonald, Deming & Gould Co., Seattle, Wash.
Clarence W. Hurlbut, Blue Banner Foods, Kent, Wash.

An invitation was extended to the British Columbia Food Technologists' Association to hold a joint meeting, on March 17, with the Puget Sound Section at the Montlake Laboratory of the United States Fish and Wildlife Service, on the campus of the University of Washington.

MOHAWK VALLEY SECTION

On January 25, the Mohawk Valley Section heard a talk by Dr. Robert C. Hockett, Scientific Director of the Sugar Researcch Foundation, who spoke informally on problems being studied by the Foundation that are of interest to members of the food industry. Following a discussion period, two motion pictures were shown, one depicting the growth and processing of cane and beet sugars, the other the idea of photosynthesis.

On February 24, the group was addressed by Mr. Thomas J. Page, Agricultural Advisor for the National Broadcasting Company, who spoke on "Certain Peacetime Applications of Atomic Energy and its By-Products, with Special Reference to Food Production and Processing."

OHIO VALLEY ASSOCIATION OF FOOD TECHNOLOGISTS PLANS TO AFFILIATE

Winter Meeting, February 5, 1949

A splendid attendance of 102 food technologists and guests was just one of the high lights of the February 5, 1949 meeting of the Ohio Valley Association of Food Technologists.

The Ohio State University and Battelle Memorial Institute served as hosts, presenting a program of interest to all.

Preceding the meeting an informal luncheon was held at the University Faculty Club, followed by registration at Battelle Memorial Institute. Members and guests were divided into small groups and conducted on tours through the Nation's leading scientific industrial institute. Those not familiar with Battelle were amazed at the facilities available and the scope of their endeavors.

Three excellent papers constituted the technical program held during the afternoon. Dr. P. O. Powers, of Battelle Memorial Institute, presented "Plastic Materials for Food Containers," a lecture that described the various plastic materials available, the physical and chemical character of each, their suitability for making films, foils, castings, latices, and calendered or extruded sheets.

Dr. O. F. Garrett, Director of Research for M & R Dietetic Laboratories, presented a fine paper entitled "Protein Modifications as Applied to the Food Industry." Dr. Garrett described numerous methods of modifying proteins, and gave several examples, stressing the use of the ion exchanges in the dairy industry.

Dr. M. L. Wolfrom, Professor of Organic Chemistry, Ohio State University, and renowned authority on sugars, lectured on "Some Aspects of Sugar Chemistry in Relation to Food Processing," elaborating upon the chemistry of the Maillard reaction in acid and alkaline media.

Professor T. S. Sutton, of Ohio State University, presided over the Round Table discussion which considered "What Industry Looks for in a Food Technologist" and, too, "What the University is Teaching its Food Technology Students." D. C. McCoy, Frigidaire, Dayton, Ohio, and R. L. Titus, Nestles Corporation, Marysville, Ohio, spoke for the food industries, and M. Paul Hudson, Dean of the Ohio State University Graduate School, spoke for the universities, describing the curriculum of a present day food technology student. This discussion brought considerable comment from the floor.

At the business session, the secretary read minutes of the November meeting, which were approved as read, and reported a treasury balance of $17.43. M. A. Youtz, of Battelle, Chairman of the nominating committee, presented the following slate of officers:

Chairman: M. H. Volle.
Vice-Chairman: H. D. Brown.
Secretary-Treasurer: D. J. Ridenour.

A motion was passed requesting the secretary to cast a ballot for the nominated officers who are to serve for one year.

Mr. R. B. McKinnis, program chairman for the Spring meeting to be held in Louisville, Kentucky, on May 21, 1949, elaborated upon plans for that meeting.

Chairman Volle appointed a committee which is to ascertain the requirements of I. F. T. for our affiliation, and to present plans for such action at the Spring meeting. Those appointed to this committee were: Dellwo—Chairman, Ridenour, Alteman, Chester, and McCoy.

In the evening there was a fine illustrated lecture by E. S. Thomas, Curator of Natural History, The Ohio State Museum. With colored slides, Dr. Thomas showed what Ohio was like "way back when." Cigarette box favors were presented by Anchor Hocking Glass Corporation, Lancaster, Ohio.

Dr. F. E. Deatherage, program chairman for the Columbus meeting, was complimented by the entire group for sponsoring the best meeting, to date, of the Ohio Valley Association of Food Technologists, and the entire group is extremely grateful to the Columbus group, Ohio State University, and Battelle Institute for this fine meeting.

DAN RIDENOUR, *Secretary.*

Book Review

FOOD PLANT SANITATION, by Milton E. Parker, Counselor in Food Production Development, McGraw-Hill Book Company Incorporated, 1948, 447 pages. Price $6.00.

This new volume on sanitation is one of a series in the publisher's "Series In Food Technology." Publication of this book is the first serious attempt to meet a widespread need in the food manufacturing industry. Previous to this, no one has attempted to correlate in one volume all of the wealth of data on the very broad field of food plant sanitation. Indeed, outside of the dairy industry, there have been few if any attempts to put down in written form either the facts involved in food plant sanitation or the methods for maintaining a high level of sanitation in such plants.

The author and publisher are to be commended for making this attempt, and it should be recognized that they had little if any guidance as to what was needed in the form of a generalized text in this field. It is an extremely diversified field ranging from establishments interested primarily in factors of bacteriological cleanliness, such as is the case in the dairy industry, to those interested primarily in insect and rodent infestation and methods for their elimination as exemplified by the milling and other industries.

The book consists in large part of paraphrases and credited quotations from leading authorities in each food field who have written concerning various sanitation problems. The sections involving the fields in which the author is known to have contributed personally are apparently written on his own authority and are very effective. Because of the major importance of the personnel problem in food plant sanitation, three chapters have been devoted to this field to good effect. Anyone reading the chapters on "Establishment and Development of Sanitary Practices," "Employee Training and Sanitary Practices," and "Maintaining Sanitary Practices" should get a good start in organizing personnel for a sanitation program.

In fields in which the author is apparently not personally experienced, there is not as much "meat." For example, in considering the legal aspects of food plant sanitation, rather little is said about a great deal, and too much about points of relative unimportance. A whole page is devoted to authenticating the contention that a member of the official governing board or an officer of a food plant corporation is personally responsible. This is very commonly known as having been substantiated by court decision and it is not believed to any great advantage in a text of this character to spend pages quoting the legal documents. The book is behind the times in its information in this field. For example, it has failed to recognize that the Food, Drug, and Cosmetic Act of 1938 is now enforced by the Federal Security Agency, rather than by the U. S. Department of Agriculture, and also neglects to discuss the new amendment now making it possible for the government to seize improperly stored food products that have become adulterated while still in interstate commerce but after shipment by the original manufacturer. This action revolves about the well-known Phelps-Dodge decision and was passed before this book went to print. Discussion of this clarification and extension of the law very definitely should have been included.

The sections on rodent and insect control are not as authoritative and informative as they could have been had the author apparently not relied too much upon other authorities and unpublished reports. For example, on page 189 there is a discussion on DDT Aerosols having proved effective against flies. This is true for Aerosols in general, not particularly DDT. The efficacy and great use of DDT in control of flies has depended upon its residual action. There is not sufficient emphasis in the chapter on insect control upon the great extension to insecticide use given by the discovery of the principle of residual sprays. Whether or not future work shows the toxicity of DDT, Chlordane, and other residual spray materials now in use to be too great to merit their application in a food plant, the fact remains that the principle of depositing insect toxic residual surface in appropriate places is a great advance in food plant sanitation. This principle is being fought by a great many manufacturers of old-time competitive products. Too much emphasis is given in the chapters on insect control to the type of products marketed by these manufacturers of competitive products and their claims for them.

The chapter on rodent control contains even a larger number of statements which are hearsay and attributable to well known manufacturers or distributors of rodent control substances. For example, on page 223, there is considerable discussion of a bait including Vitamin E as wheat germ oil which allegedly affords a particular attraction for rats. Whether or not this statement has factual support in literature is open to question. Extended research on the part of biologists has failed yet to disclose any bait or poison which forces a rat to leave the premises to die because of suffocation. Rats tend to go to their homes when sick. If their nests or homes are within the plant, it is there that they will take refuge, not outside the plant. On page 225, some discussion is made of "Castrex" by its technical name. This substance is not a good rodenticide. A statement is also made that ANTU can only be used by responsible and qualified persons. This is true of "1080," not of ANTU. ANTU is sold generally throughout the country and is recommended as a substitute for Red Squill in the case of the Norway rat. It is valueless with regard to other rats and mice. There is also included a discussion on rodent deterrents, the information contained in which has not been substantiated scientifically.

In the opinion of the reviewer, the writer is to be commended for attempting to bring out an overall food plant sanitation text. He has done a good job, although this book can not be relied upon as an authoritative reference book. It is merely a thorough discussion of subject matter that has previously been generally available only in individualized pamphlet form, but the information has always been weighed against its source. It is hoped that readers of this book will not rely upon such biased information without weighing it where credited against its commercial origin. Unfortunately,

not all such questionable material is credited as shown by the examples given above. EDWARD L. HOLMES.

AQUAMETRY. APPLICATION OF THE KARL FISCHER REAGENT TO QUANTITATIVE ANALYSES INVOLVING WATER, by John Mitchell, Jr., and Donald M. Smith, of E. I. du Pont de Nemours, Inc., Wilmington, Delaware. Interscience Publishers, Inc., New York, 1948, 444 pages. Price $8.00.

The determination of moisture has always been of major concern to all who buy or sell materials on specification, and in particular to quality control and production control men in the food processing industries. Now at last a book has been published with detailed discussion of the theory and procedures for the rapid and accurate determination of water by volumetric titration with Karl Fischer reagent. The name "Karl Fischer Reagent' has become generally accepted for a solution of iodine and sulphur dioxide in pyridine and methanol, first developed in 1935 by Karl Fischer, applications of which have been found in many fields of analytical work. The methods are rapid, and reproducible results compare well with those of official methods. Karl Fischer titrations may take 10 minutes to one hour for a series of determinations; while, for example, the Bidwell-Sterling method or the oven drying methods may require two to six hours. No additional indicator is needed, as the Karl Fischer reagent itself is a most sensitive colorimetric indicator. As long as water is present, the iodine color of the reagent is dissipated. When all the water has reacted, the iodine color persists.

The book is divided in two parts. The first part deals with the specific quantitative determination of water. One chapter discusses the chemical nature of the Karl Fischer reagent, another gives details regarding titrimetric procedures for using the reagent, while other chapters are concerned with determination of water in organic compounds and commercial organic materials, including fats and oils, foodstuffs, petroleum products, and naval stores. Those few compounds or classes of compounds which may interfere with the determination are thoroughly discussed and procedures given for their removal or for rendering them inert. The second part of the book deals with organic reactions involving liberation or consumption of water, showing some applications of the Karl Fischer reagent to quantitative determination of organic functional groups, such as alcohols, carbonyl groups, carboxy acids, amines, acid anhydrides, and nitriles.

A good bibliography, footnoted directly within the individual chapters, makes it easy to refer to original articles for more detail on any phase of the work. The organization of the material and its arrangement within the divisions and chapters make it readily useful as a laboratory reference manual. The reviewer has no doubt that this book with its compilation of methods and discussion of theory will bring about many changes or at least a shift in emphasis in analytical laboratories. This book should be of particular value to the men who control quality and production in the food industries, and should prove an invaluable addition to every technical library. RALPH C. ZALKAN.

Abstracts

(Continued from page 6, preceding Editorial)

ascorbic acid content is that when the final product is reconstituted, it is more concentrated than the fresh juice and, therefore soluble solids and ascorbic acid are higher.

137I. Where do frozen concentrates go from here?

Quick Frozen Foods, 11, 47-9, Nov., 1948.

Concentrates have taken 12% of the market from canned products. The big three are, Birds Eye, Snow Crop., and Minute Maid, with 90% of the market. Quality is holding up and a brilliant future is predicted.

138I. Utility of high frequency heating in the frozen food industry.

BARTHOLOMEW, J. W. *Quick Frozen Foods, 11,* 59-61, Nov., 1948.

The metal and plastic industries are using high frequency heating, but there are few installations in the food field. The possibilities in part are: (1) inactivation of enzymes, (2) thawing of frozen foods, (3) continuous pasteurizing in 5-15 seconds, (4) inactivation of molds on baked goods, (5) inactivation of insect eggs, (6) cooking of foods, and (7) sterilization of canned foods. Mention is also made of the high cost of installations, their unadaptability to other than the prescribed operation and certain technological difficulties.

MILK AND DAIRY PRODUCTS

139I. Manufacture, use and storage of dehydrated sweetened condensed skimmilk.

MUSSETT, A. T., AND MARTIN, W. H. *Ice Cream Tr. J., 44,* 54, Dec., 1948.

Twelve small lots of powder were made in an experimental drier under the different conditions being studied. In the phase concerning manufacture, the factors studied were the temperature in the drying chamber, atomizing pressure and degree of concentration of the liquid to be dried, and their effects upon moisture content, flavor, color, and texture of the finished product. A total of 33 mixes were made and frozen to obtain data on the suitability of sweetened powders in ice cream. From the standpoint of acidities, mixes containing sucrose sweetened powder produced results which were more desirable than the control mixes, while mixes containing maltose sweetened powder resulted in acidities which were high. Observations made on the ease with which the different powders were incorporated into the mix indicated that sucrose and maltose sweetened skimmilk powders were more easily and completely dispersed in the mix than was either skimmilk powder or the pulverized skimmilk powder-sucrose mixture. The best results were obtained when sweetened skimmilk powders were stored for two months in glass or tin containers at either room temperature or 40° F.

140I. The manufacture of a high quality chocolate milk drink.

FORBES, B. P. *Southern Dairy Products J., 44,* 42-3, July, 1948; *J. Dairy Sci., 31,* A139, No. 362 (1948).

Cocoa powder rather than chocolate is used in the preparation of chocolate milk drinks. The necessity for scrupulously observing the rules prescribed by the flavor manufacturer is obvious. In using reconstituted milks, the solids should be the same as in fresh milk. Settling may be caused by: insufficiently stabilized cocoa; too much milk or insufficient butterfat content; dilution of dairy drink by milk or water; restriction of valves on pressure side of pumps, causing a homogenizing effect or excessive whipping by centrifugal pumps; too acid milk (do not neutralize); using soda-neutralized milk; using frozen milk; incorrect pasteurizing and cooling; insufficient heat or too short holding time; over-agitation during and after cooling; powder not entirely incorporated; not cooled to 40° or lower; precooling below 140° in the vat. Thickening may be caused by excessive pasteurizing temperature; overstabilization; use of lime or magnesium stabilizers; improperly rinsed bottles; milk which is too acid.

Why you should know more—now—about Ac'cent®

the startling new development in MSG

Ac'cent is beyond doubt one of the most unusual and promising items in the food world today.

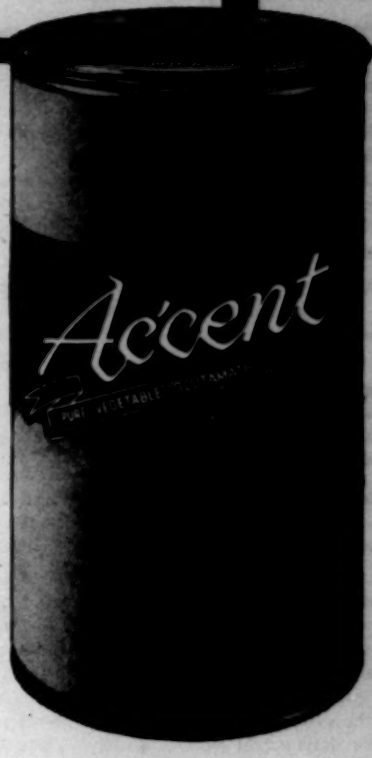
Much has been written about it, many have tried it, more every week are beginning to use it. Its effect in improving and *sustaining* flavor in foods is little short of amazing. Even at this early stage, the possibilities that can be seen in Ac'cent are great enough to merit, we believe, the serious attention of all food processors.

Ac'cent is a 99+% pure MSG . . . mono sodium glutamate. It is not a flavoring, not a condiment. It adds no flavor, no aroma, no color of its own. The action of Ac'cent is to bring out, intensify the natural *flavor of food itself. By doing so, it is wonderfully effective in overcoming the usual flavor-loss suffered in processing.*

Ac'cent is an unblended *MSG. Thus in itself and in its effect on foods, Ac'cent is unlike many compounded glutamates which you may have known about and even tried in the past. In Ac'cent you get the maximum benefit of this vegetable protein derivative.*

We invite you to judge for yourself what Ac'cent can do to enhance and strengthen flavors in one or more of your foods. Members of our staff of food technologists and chefs are available on call to consult with you in your plant, explain the use and effect of Ac'cent, and supervise tests of it in your products. *Send for information we have on your product.*

You be the judge . . . but prepare to be surprised!



In 200 lb. drums

A TYPICAL TEST OF AC'CENT —IN FROZEN PEAS—

Take two packages of frozen peas from the same lot. Allow to thaw or partially thaw in the usual manner, then drop them into separate saucepans containing the required amount of boiling water. Immediately, add to one saucepan ½ teaspoon of Ac'cent and continue to cook both in the regular manner. When done, taste the difference. Note the fullness, the freshness of flavor in the one containing Ac'cent.

Write **Amino Products Division—Dept. FT-5**
International Minerals & Chemical Corp.
General Offices: 20 North Wacker Drive
Chicago 6, Illinois

Ac'cent makes food flavors sing♪

Printed in U.S.A.

Trade Mark "Ac'cent" Reg. U.S. Pat. Off.